IP&E News

2nd Quarter 2021

ARROW

Future vision and technology of smart cities

2020 shows that there is a rise in awareness towards smart cities. Many major automobile manufacturers and telecommunications companies formed business and capital alliances for smart city projects in 2020.

Scan the QR-Code to read more about the future vison and technology of smart cities.

Whitepaper "Smart city"
The following items are touched on in the downloadable whitepaper.
– 8 "smart parameters"
– Effects on the cityscape
– Problems and factors for success
– Market scale predictions by segment
– Visions for smart building
– Technology trend details
– Murata's technologies

Scan the QR code and request the whitepaper.

IP&E by Arrow
Providing components
for success

Components – EMEA

Content

Before cold becomes a problem – How customers find the solution in cooperation with Arrow and suppliers.

Flexible, space-saving solution
for heating batteries.

Advanced lithium batteries are extremely complex systems. Larger battery systems consist of many cells with sophisticated control by a battery management system (BMS). The battery management system monitors the charge and discharge of each individual cell depending on its charge level and temperature. The BMS is crucial for the lifetime of the overall system and prevents dangerous situations during operation.

It is well known that the efficiency of lithium cells is strongly dependent on temperature. At low temperatures, the internal resistance of the cells increases significantly, so the power that can be drawn and brought in decreases. In addition, charging at sub-zero temperatures damages the cell chemistry and reduces service life. Therefore, in addition to balancing the state of charge of each cell, monitoring and correcting the temperature is essential.

A customer from the industrial sector had just such a temperature problem and turned to Arrow with it. A wide operating temperature range is a key requirement especially in battery solutions for mobile and stationary outdoor energy storage. In the past, cell management and temperature control were implemented in separate assemblies on rigid boards and with complex cabling.

In addition to providing technical advice on standard products from various manufacturers, the Technology Application Engineers (TFAE) at Arrow are tasked with advising customers on the development of customized, customer-specific solutions.

After Arrow was asked to heat lithium batteries, a constructive teamwork process began in which the customer, an Arrow team, and the manufacturer suggested by Arrow together worked out the various possible solutions.

Amphenol Sincere, Flex Circuits & Industrial Product Ltd.

During the search for solutions, the focus was on flexible printed circuit boards (FlexPCB), which can be ideally adapted to a given application. The portfolio of Arrow's partner Amphenol includes not only connectors but also these complex flex PCB systems. The special feature of these FlexPCBs is the integration of the cell heater and the nickel tabs used to weld the aluminum contacts of the battery cells.

After the first layout drafts, detailed construction, incorporation of numerous requirements in several revisions, and a pilot series the batteries went into serial production. The close cooperation with Arrow and Amphenol significantly shortened the time needed for development, which still took 3 years. In addition, this innovative solution does without several previously required components and helps customers save space and assembly time.

This approach and process exemplify how Arrow can assist its customers with the development of new products, both technically and commercially.

Jörn Herrmann
Technology Application Engineer Connectors,
Cable & Wire (DACH), Arrow

USB 4.0 Type C – The Next Generation

The USB has been one of the most accepted standards of wired data and power transfer for the past couple of decades. Amphenol has always developed high-performance USB solutions meeting the specifications of each new generation and variations. Amphenol is one of the earliest adopters of USB 3.1 Gen 2 Type C connector and has a comprehensive range of USB 2.0, 3.0, and 3.1 generation connectors that come in straight, right angle, surface mount, and through-hole configurations. Keeping up with the legacy, we are introducing the latest iteration of the USB standard- the all-new USB 4 Gen 3 Type-C connectors.

Features of USB 4
Outperforming the present standards, these next-generation connectors are capable of meeting high data transmission rates of up to 40 Gb/s. Amphenol's USB connectors are compatible with the Thunderbolt interface which combines power charging, tunneling USB, and PCIe® data transfer through a single Type C connector interface. One of the salient features of these connectors is its capacity to adjust the bandwidth dynamically while transferring video and data. These connectors support both DisplayPort video and audio protocol with 4K UHD at 60 Hz display.

The new USB 4 connectors are backward compatible with the previous versions with reversible plug and cable orientation, which provides an enhanced user experience and are tailor-made for emerging Consumer electronics applications that are well-positioned to make the perfect use of this technology.

- Power delivery up to 100 W high-speed transmission up to 40 Gb/s
- High-speed transmission up to 40 Gb/s reversible plug and cable orientation
- Support 4K UHD 60 Hz display
- Reversible plug and cable orientation
- All-in-one simplicity

Orderable at arrow.com
- GSB4D313302Y1HR
- 12402056E512A
- 12402073E512A
- 12402075E512A

Vertical Dual Row Top Entry Card Edge

The AVX vertical card edge connector was originally designed for perpendicular Board-to-Board as single row contacts connection, but now AVX Interconnect is expanding with dual row version to fill the gap in the market.

The newest addition to AVX´s broadening line of one piece card edge connectors is the 4p-12p dual row top entry version 9159-650, which is extension of popular single row version 9159-550. This new configuration with staggered dual row contacts will allow doubled number of positions in similar size of the connector. Available in both without and with polarization where the mating PCB layout is modified to form a key, to avoid wrong insertion to the connector.

This small connector is packed with several key features that provide significant functionality in a broad range of applications. The proven contact system is gold plated for enhanced reliability, signal integrity and full 2.5A/contact current rating. The connector is designed for mating PCB board with 1.6mm thickness and gold plated pads.

Top Selling Points
– The new 9159-650 is very unique dual row vertical card edge connector for perpendiular BTB connection with small size
– Excellent electrical and mechanical performance provide high integrity connections in harsh environments
– Version with polarization key assure correct connection of mating PCB
– Kapton tape version for pick and place robotic placement
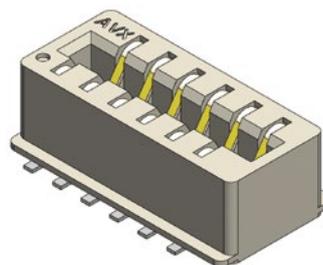
Orderable at arrow.com

Capton
– 00 9159 004 651 906 (4ways)
– 00 9159 006 651 906 (6ways)
– 00 9159 008 651 906 (8ways)
– 00 9159 010 651 906 (10ways)
– 00 9159 012 651 906 (12ways)

No capton
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– 00 9159 006 653 906 (6ways)
– 00 9159 008 653 906 (8ways)
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Capton, Polarization
– 00 9159 004 651 916 (4ways)
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– 00 9159 010 653 916 (10ways)
– 00 9159 012 653 916 (12ways)

BELDEN

Seamlessly Integrated Solution for Smart Factories

Reliable – Maximum Network Uptime
Improve your network availability through modular and powerful networking devices and redundancy protocols. Prepare for precise and deterministic communication needs with TSN-ready solutions. Swap in redundant power supplies without network downtime.

Fast – High-Speed Data Transfer
Filter and route large quantities of data to the right location at high uplink speeds. Ensure your network can support future bandwidth demands up to 2.5 and 10 Gigabits. Select high-speed, high-port count devices to connect a growing number of networked devices.

Secure – Protected Data Flow
Keep your OT data and network secure with real-time asset visibility and threat management. Take a comprehensive approach to security by leveraging out-of-the-box appliances built for industrial protocols, and devices with embedded security mechanisms.

Valuable – Purpose-Built Functionality
Stretch OT budgets further by investing in future-proof and multifunctional solutions. Get the powerful device features you need without paying for anything extra. Leverage smaller, more compact devices to save valuable space on the factory floor.

Hirschmann BOBCAT Next-Gen Managed Switches
Compact and powerful switches with up to 24 ports and fast Ethernet speeds up to 2.5 Gbit/s.

Hirschmann Valve Connectors
Comprehensive solution to connect solenoid valves, pressure sensors, temperature sensors and flow monitors to voltage supplies or a data network.

Hirschmann SPIDER III PoE Standard Line Ethernet Switches
Unmanaged switches with customizable features, plug-and-play installation and longdistance data transfer.

Lumberg Automation M8/M12 Connectors & Cordsets
Extensive portfolio of sensor/actuator connectors for factory or machine automation.

Orderable at arrow.com

ARROW

IP&E Linecard

– **Connectors**

– **Passives**

– **Antennas, Batteries, Emech**

– **Power Supply**

Take out the linecard or

download here:

arrow.com/en/ipe/download-area

Technologies by Supplier

Supplier	Conntector													Antennas, Batteries, Emech								Passives																		Power Supply		
	Sockets & Contacts	Board to Board	Wire to Board / Wire to Wire	FFC / FPC	Terminal Blocks & Acessories	I/O Connectors	Industrial Connectors	Fiber Optic	High Speed	RF Connectors	Cables	Cable Assemblies	Cable Management Accessories	Relays	Switches	Thermal Management	Batteries	Antennas	Sensors	Test & Measurement	Soldering Tools / Accessories	Ceramic Capacitors	Silicon Capacitors	Tantalum Capacitors	Aluminum / Film Capacitors	Super Capacitors – NEW	Fixed Resistors	Non Linear / Variable Resistors	Fuses	Varistors	Inductors / Chokes / Coils	Ferrites / Ferrite Beads / EMI Filter	EMC Power Filters	Planar Magnetics	Transformers	Thermistors	Timing Devices	Buzzer	RF Products	AC/DC	DC/DC	LED Driver
3M	•	•				•	•					•				•																										
Aavid Thermalloy																•																										
ABB													•																													
ABB Power[1]																																								•	•	
Abracon																		•													•	•	•		•	•	•					
Absopulse																																								•		
Adam-Tech	•	•	•	•	•	•			•	•	•	•				•																										
Advanced Energy[2]																																								•	•	•
Advanced Thermal Solutions																•																										
Aimtec																																								•	•	•
Alpha Wire										•	•	•																														
Alutronic																•																										
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Ansmann																	•																									
Apem*															•																											
Apex Tool																					•																					
APTIV		•			•				•	•		•	•																													
Arrow VAS																																								•	•	•
Assmann WSW	•	•	•	•	•	•	•				•	•	•			•																										
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Bel Power																																								•	•	•
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BI Technologies (TT Electronics)																										•	•															
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Cornell Dubilier																									•																	
Cosel																																								•	•	
Crydom														•																												
CUI[3]																																								•	•	
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Digisound																																						•				
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Finder*														•																												
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Fox Electronics																																					•					
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Fujitsu*	•	•			•	•										•																										
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Honeywell																•			•																								
Hongfa														•																												
ICEL																									•																	
Inno Tape																•																										

*not in all EMEA countries [1]GE Critical Power, Lineage [2]Artesyn, Excelsys, Ultravolt [3]Aquired by Bel Power [4]3Y Power Technology, Protek Power

Technologies by Supplier

Supplier	Sockets & Contacts	Board to Board	Wire to Board / Wire to Wire	FFC / FPC	Terminal Blocks & Accessories	I/O Connectors	Industrial Connectors	Fiber Optic	High Speed	RF Connectors	Cables	Cable Assemblies	Cable Management Accessories	Relays	Switches	Thermal Management	Batteries	Antennas	Sensors	Test & Measurement	Soldering Tools / Accessories	Ceramic Capacitors	Silicon Capacitors	Tantalum Capacitors	Aluminum / Film Capacitors	Super Capacitors – NEW	Fixed Resistors	Non Linear / Variable Resistors	Fuses	Varistors	Inductors / Chokes / Coils	Ferrites / Ferrite Beads / EMI-Filter	EMC Power Filters	Planar Magnetics	Transformers	Thermistors	Timing Devices	Buzzer	RF Products	AC/DC	DC/DC	LED Driver
Connector → (cols 1–13)														**Antennas, Batteries, Emech** → (cols 14–21)								**Passives** → (cols 22–39)																		**Power Supply** → (40–42)		
iNRCORE (former PulseR)																															•				•							
Invensense																			•																							
IQD Frequency Products																																					•					
ITT Cannon	•	•	•	•		•	•					•																														
ITW Switches															•																											
Jamicon																									•																	
Johanson																		•				•									•				•							
JST	•	•	•	•		•	•					•																														
Kamaya																											•															
KAT Mekatronik															•																											
KEMET														•		•			•			•		•	•	•					•	•	•	•	•				•			
Keystone	•				•																																					
Knitter-Inductive																															•				•							
Knitter-Switch															•																											
KOA																											•		•	•	•											
Kontakt Chemie (A division of CRC Industries)																					•																					
Kyocera	•	•	•						•																										•		•					
Lapp											•	•	•																													
Lelon																									•																	
LISI Automotive			•																																							
Littelfuse																													•	•	•					•						
Littelfuse (Brand Hamlin)														•					•																							
Lumberg		•	•	•	•	•						•									•																					
Lutronic												•																														
Marschner Tabuchi																																			•							
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Metrofunk											•																															
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Neutrik*			•			•																																				
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NKK															•																											
Novapax Kunststofftechnik			•										•																													
NuEnergy Storage Technologies																	•																									
Omeg																												•														
Omron	•	•	•			•			•					•	•				•																							
Optek Technology																			•																							
Osram																																										•
Panasonic Electric Works		•		•		•	•							•	•				•																							
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Pancon	•	•	•	•		•	•		•			•																														
Panduit							•						•																													
Panstrong	•									•																																
Phoenix Contact	•	•	•		•	•					•	•	•																													
PMEC																																			•							
Preci-Dip	•	•	•			•																																				
Pulse						•			•									•													•	•	•		•	•						
Püschel (FSP)																																		•								
Radiall		•				•				•		•		•																												
Raffenday											•																															
Rafi*															•																											
Recom																																								•	•	•
Rennsteigwerkzeuge																					•																					
RF360																																					•		•			
Ria Connect*					•	•																																				
Samsung Electro-Mechanics																						•				•					•	•										
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SIBA																													•													
SiTime																																					•					
SKS Kontakttechnik											•	•	•																													
SL Power																																								•		•
SongChuan														•																												

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Technologies by Supplier

Supplier	Conntector													Antennas, Batteries, Emech								Passives																		Power Supply		
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Souriau*		•				•						•																														
Standex-Meder														•	•				•												•				•							
Sumida			•								•	•																														
Sumitomo			•										•																													
Susumu																											•									•						
Syfer Technology																						•										•										
Tadiran Batteries																	•																									
TDK																		•	•			•				•					•	•	•			•	•					
TDK-Lambda*																																								•	•	•
TE Connectivity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•												•	•				•	•	•				
TKR Spezialwerkzeuge																					•																					
Traco Power																																								•	•	
TRP			•			•																																				
TXC Corporation																																					•					
Varta																	•																									
Vicor																																								•	•	
Vishay														•	•							•		•	•	•	•	•	•	•	•	•				•	•	•				
Vishay PG																											•															
Vitrohm																											•															
W+P Products	•	•	•	•		•					•	•	•																													
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Wima																									•	•																
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ZF Friedrichshafen														•					•																							
Zippy														•																												

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HellermannTyton

Compact TY Cable Tie Mounts

The small rectangular design of the TY-Series cable tie mount makes it ideal for any application in telecoms, switchgear and control cabinets.

These screwable 2-way cable tie mounts are a compact yet robust solution for efficiently routing cables where space is minimal. Self-adhesive versions that aid placement before screwing are also available.

Select from two sizes for use with standard nylon cable ties (4 mm and 8 mm strap widths). Both dimensions (small: 20 mm x 14 mm x 3.7 mm and large: 32 mm x 25 mm x 5.5 mm) feature a concave upper surface that cradles larger diameter cables and bundles. Black coloured versions manufactured from weather-resistant polyamide 6.6 are available especially for use in outdoor applications.

Orderable at arrow.com
– 151-21319
– 151-21819
– 151-11319
– 151-11310
– 151-11819
– 151-11810

molex

Designing for the Connected World

The internet has changed our lives forever, not just in the way that we connect with each other, but also in the way that our technology connects with other devices. This is the cornerstone of the internet of things (IoT), which allows machines to share information in new and exciting ways. The technology that is enabling our connected lives has led to great changes in many areas of modern society, from the cars we drive to how we receive medical care.

Connected Industry

In the manufacturing sector, the industrial internet of things (IIoT) has brought with it a new phrase: Industry 4.0. This is the name given to the latest revolution that relies on data as one of its key raw materials. The result is the smart factory – a factory in which every machine is part of a network that shares information at all phases of the production process.

The Smart City and the Smart Grid

The same technology that monitors every aspect of a manufacturing process also is being deployed in cities. As just one example, modern technology has changed the way our energy is created. Compared to the centralized structure of the conventional power network, small power plants are now efficient alternatives. Known as distributed energy resources (DERs), they combine familiar wind and solar generation with new technologies, including biomass-fueled plants and even geothermal sources, to supplement traditional power stations.

Wearable Technology

The medical industry has been quick to realize the power of wireless and connected devices. Solutions for patient monitoring have traditionally used inconvenient wired connectivity. However, the latest developments in miniaturized electronics and high-speed, secure wireless connectivity mean that modern wearable sensors are both lightweight and highly capable. Devices that are fully connected allow patients to be monitored in real time, enabling patients with long-term conditions can be treated in their own homes...

Click below or scan QR-Code to read the full story

Designing for the Connected Ecosystem: The Digital Change That's Driving Connected Living | Arrow.com

Ready-to-Use Antennas

Molex provides compact, high performing Antennas, available in multiple form factors for all common antenna protocols and frequencies used in IoT, automotive, industrial, and medical applications.

Orderable at arrow.com

Easy-On FFC FPC Connectors

Easy-On FFC/FPC connectors deliver a versatility unmatched by others with terminal pitches that range from 0.20 mm to 2.00 mm for applications from tiny wireless earbuds to the factory floor.

Orderable at arrow.com

FiT Family Power Connectors

The FiT Families Power Connectors provide design engineers with fully protected header terminals in a small package. With cutting-edge designs that ensure long-term reliability.

Orderable at arrow.com

![muRata INNOVATOR IN ELECTRONICS]

300 W chassis mount DC-DC converter

IRV300 with 10:1 ultra-wide I/P Voltage range

Murata announces a new 300 W chassis mount ultra-wide 10:1 DC input range converter with patented inrush current control topology and high efficiency >92 % from Murata Power Solutions. The IRV300 is a fit-and-forget module designed for harsh operating environments in railway and industrial applications. It complies to EN50155, EN50121, and EN45545, and has an operating ambient temperature range of -40 °C to +85 °C.

Features
– 16.8 V – 160 Vdc input
– 12 V, 24 V, 54 V single outputs
– Enable on/off
– Input under-voltage lockout adjustment
– Wide output voltage adjustment range and LED indicator
– Hold Up Function
– Parallel Function

Benefits
– Ruggedized and encased for harsh environments
– Output voltage adjustment capability of up to ±15 %, which covers all major application voltages

Orderable at arrow.com
– IRV300*

AQV209G PhotoMOS® Relay: A new era of high power switching

The new Panasonic Industry 1FormA PhotoMOS® relay AQV209G is an undisputed breakthrough in terms of high power semiconductor switching – remarkably outperforming the last generation's specs by a 10 times higher switching capability.

This is a highly desirable improvement, when looking at the fast-paced technological progress of almost any industrial equipment – and the corresponding performance requirements on the necessary components.

Based on a combination of proven technology with next-gen materials and galvanic isolation between input and output circuit, the photo-coupled AQV209Gachieves an unrivaled output rating of 1,200 V at 0.75 A - continuously, with unlimited lifetime, ready for both AC and DC load. Notwithstanding this performance increase, this latest member of the PhotoMOS® family is still coming in a small standard DIP6-pin housing, feasible by an outstanding low ON resistance of typically 1.O Ohm.

Given all this, the AQV209G type undoubtedly is an interesting and future-proof substitute for a lot of conventional reed relay applications or as an replacement for mercury containing types. Ensuring quiet, fast and bounce-free switching, it will be a recommended choice for a wide field of modern industrial applications, testing and measuring equipment, controls or I/O modules – and for sure a blueprint for next-gen component performance.

Features at a glance
– 1,200 V load voltage
– 0.75 A load current
– AC / DC dual use
– 1FormA type
– 1.0 Ω ON resistance (typ.)
– DIP6 type – SMD or THT version
– Noiseless switching
– Endless lifetime
– Galvanic isolation between input and output circuit

Orderable at arrow.com
– AQV209G

PANDUIT™

Edge Clips - On the edge, get set, go

Edge Clip Cable Tie Mounts - On the edge
Panduit's new Edge Clips are versatile, quick, and secure to attach directly to panel and frame edges. This allows cables or wires to be routed along or perpendicular to the edge in a user-friendly manner. To do this, simply press the clip directly onto the respective edge and use the matching cable tie for bundling. Drilling into the existing structure is unnecessary, components remain intact to resist corrosion and overall installation efficiency is increased. The high-performance clips offer high tensile strength thanks to the specially developed metal lips and can still be attached by hand without tools. The combination of innovative Edge Clips, robust cable ties and cable tie bases from Panduit find their professional use in the cabling of motor vehicles, rail vehicles, heavy-duty machinery, trucks, all the way to solar parks for cable routing underneath panels.

Versatile Mounting
Allows cables or wires to be routed along or perpendicular to the edge.

Close Fit
The cable tie mount saddle provides close fit for small diameter bundles.

Storage Reduction
Versatile mounting reduces the space of storage required and gives you much more flexibility when mounting on site.

Expanded Range
The Edge Clip has an extended range from .7 – 3 mm edge thicknesses as well as a larger clip offering for 3 – 6 mm edge thicknesses.

High Performance
The high-performance metal clip delivers high pull off force yet still allows for easy hand installation without tools.

Orderable at arrow.com
- CME12-M300
- CME24-M300
- CMS12-M300
- CMS24-M300
- CMEA12-2S-D300*
- CMEA24-2S-D300*
- CMSA12-2S-D300*
- CMSA24-2S-D300*
- CMEB12-2S-D300*
- CMEB24-2S-D300*
- CMSB12-2S-D300*
- CMSB24-2S-D300*
- CMEA12-B2S-D300
- CMEA24-B2S-D300
- CMSA12-B2S-D300
- CMSA24-B2S-D300
- CMEB12-B2S-D300
- CMEB24-B2S-D300
- CMSB12-B2S-D300
- CMSB24-B2S-D300

PANTA© SMD – More cost-effective alternative to rigid flex
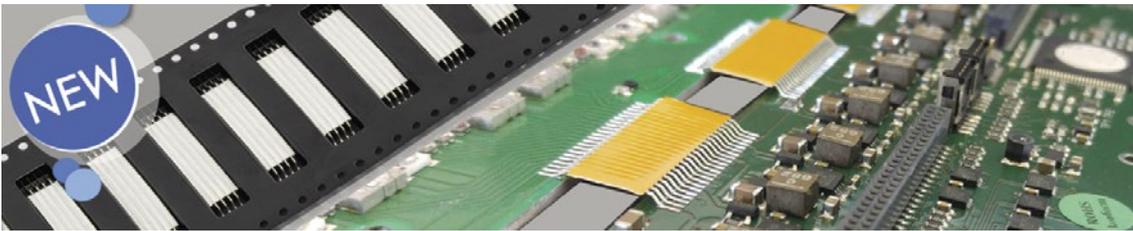
Compared to the rigid-flex solution, we offer a more cost-effective alternative. Sumida's SMD solution has already successfully replaced the Rigid-Flex in several cases. Especially the advantages that this SMD solution offers multiple layout options and is more cost effective than the Rigid-Flex. The application of the SMD jumper offers the advantage to combine a well known pick & place process with reflow soldering and the usage of standard FR4 board material, that furthermore reduces the bill of material cost.

Since then, it has been widely used in the automotive and industrial sectors.

Features

– Usage in automotive, industrial and medical technology
– Fulfills part accuracy and tolerance requirements for standard pick-and-place machines
– Vibration resistance
– Processing according to standard soldering profiles DIN EN 61760-1 / J-STD-020
– Subsequent angling of the connected PCBs of up to 180° possible

Orderable at arrow.com

– PANTA© SMD

Example					
	SMD		**SMD R**		
Order Code					
Pitch	0,5 mm	0,93 mm	1,0 mm	1,25 mm	1,27 mm
Pin number max.	8 – 32 **	4 – 25	4 – 16	4 – 16	4 – 16
Bridging length	11,2 mm	11,2 mm	20 – 40 mm	20 – 40 mm	20 – 40 mm
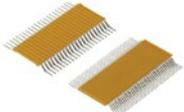
To learn more about our PANTA SMD visit
www.sumida-flexcon.com or contact us on
infoflexible@eu.sumida.com

Introducing 16G 0.5 mm Stacking Connectors for COM Express
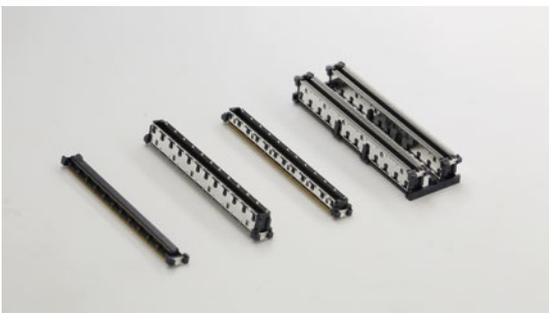
TE Connectivity's (TE) new 16G 0.5 mm free height stacking connectors can help save time and money when making COM Express module upgrades to 16G speeds in autonomous industrial machinery to meet the needs of Industrial Internal of Things (IIoT) and Industry 4.0. With the same PCB footprint as all COM Express standard connectors, there is typically no need to change PCB layouts when making upgrades to your machine when using the TE connector. TE's product is also backward-compatible with previous generations of stacking COM connectors and is compatible with competitive products.

The mating and unmating force of TE's connector is reduced by 30 % compared to competitive products as well as TE's previous-generation products. This can help reduce operating cycle times and operating cost and enhance machine productivity.

These connectors provide double the speed of most previous-generation products – up to 16 GT/s – for use in today's smart machinery. When used together, the plug and receptacle solution provides industry-leading signal integrity enabled by improved contact designs.

Key Benefits
- Faster data speed – up to double previous generations – with compatibility to PCIe Gen 4 applications
- New contact design enables better signal integrity when compared to previous generation TE products and to other comparible products in the market
- ~30 % improvement in mating/unmating force enables easier operation
- Same footprint as COM Express standard interconnect means there is typically no need to change PCB footprints when upgrading applications
- Multiple configurations enable system design flexibility

Applications
- COM Express modules
- Other applications requiring vertical-to-vertical parallel board-to-board connections, e.g.:
  - Embedding modules
  - Customized carrier/PC/control boards

In addition to industrial machinery & equipment, these products are also frequently used in:
- Test & measurement equipment
- Medical devices & equipment
- Aerospace & defense
- Computer equipment & peripherals
- Telecommunications equipment
- Security devices

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- 2357739-1
- 2369315-1
- 2357798-1
- 2357787-1
- 2357739-2

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